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(54) Method and machine for the sequential storage and drawing of hides

(57) Method for the sequential storage of hides transported by a conveying surface on which said hides are positioned one after the other, comprising the following operations:
driving and deposit of the hides from the conveying sur-

face onto at least one flexible foil; winding of the flexible foil with the hides on a rotary support to form a spool. The method is implemented by means of a winding machine comprising a frame (2) that supports a winding unit (6) and an unwinding unit (7) of the flexible foil (4).

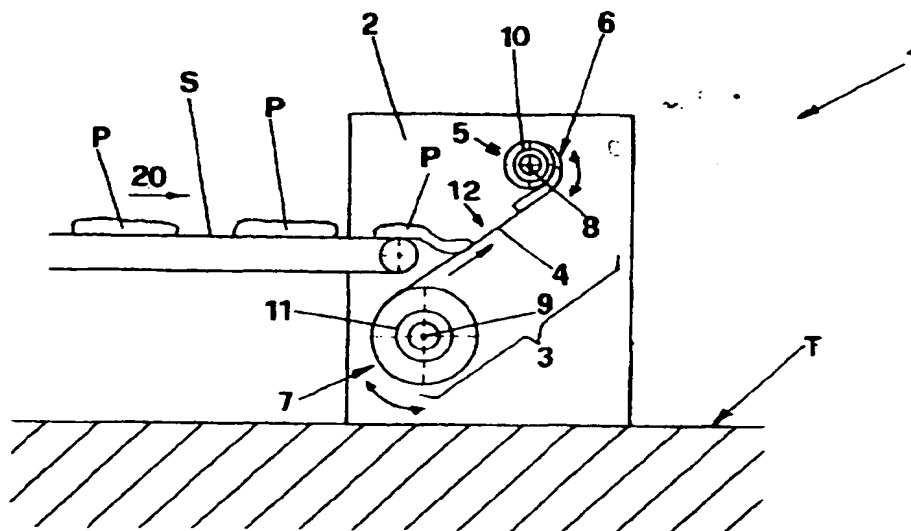


FIG.1

Description

[0001] The invention concerns a method for the sequential storage of hides, particularly suitable for stocking semiprocessed or finished hides, and a machine suitable for implementing this method.

[0002] It is known that in hide processing it is necessary to store semiprocessed hides temporarily, for example between a processing stage and the successive one, and to stock finished hides.

[0003] The methods employed for the stocking or temporary storage of hides are based on criteria that give primary importance to space saving, though guaranteeing the physical soundness of each single hide, in order to facilitate the successive processing stage to which the hides must be subjected.

[0004] The method according to which the hides are stacked on a support, generally constituted by a pallet, is already known: this method makes it possible to form a hide pile that develops mainly vertically.

[0005] The known machines suitable for implementing the method described above and called "stackers" substantially comprise a frame supporting a conveying surface with mainly longitudinal development, on which the hides are laid in such a way as to be transported and then put on a retractable plane that unloads them on a pallet.

[0006] The retractable plane has a mainly longitudinal development and is located in a substantially horizontal position under the conveying surface, from which it protrudes due to the fact that it is horizontally movable at a variable distance from the ground. Under the retractable plane there is a pallet where the hides are stacked.

[0007] More precisely, the retractable plane is anchored to the frame, so that it can shift horizontally and disappear under/protrude from the conveying surface and is provided with rollers positioned transversally with respect to the development of the plane and defining the hide support surface.

[0008] According to the stacker operating principle, as the conveying surface transports a hide, the retractable plane must gradually protrude from the conveying surface itself, until the hide has been completely deposited on it.

[0009] At this point the plane is retracted and at the same time the rollers are rotated so that the hide, owing to the reciprocal travel motion of the plane and rotating motion of the rollers in the opposite direction, remains positioned on the pallet and falls on the hides that have already been stacked due to the force of gravity.

[0010] Appropriate anchorage devices provided on the material handling means permit the anchorage and successive transport of the hide pile towards the successive processing station or towards the warehouse.

[0011] The successive collection of the hides from the piles created by the stackers to feed, for example, the machine that must carry out the following processing stage is performed manually, in fact the operator takes

the hides one by one and positions them on the machine.

[0012] The main drawback of the stocking method described above is constituted by the considerable space occupied by the hides, which, being laid and stacked over one another, occupy a surface that corresponds at least to their own surface.

[0013] Another drawback is due to the fact that this method can be adopted for hides with limited length, in order to limit the pile length accordingly and therefore to ensure reasonable manoeuvrability and ease of transport.

[0014] As far as the stacker is concerned, its main drawback is constituted by the fact that its size is at least twice the length of the hides to be stacked, since it is necessary to deposit the spread hide on the retractable plane.

[0015] Another drawback is due to the numerous kinematic motions of the stacker, which are necessary to operate the retractable plane and the rollers and to adjust their distance from the ground.

[0016] Furthermore, the machine is expensive and quite difficult to set up, due to its complex operation.

[0017] The aim of the present invention is the achievement of a method and a machine that make it possible to overcome the inconveniences mentioned above.

[0018] More precisely, the main aim of the invention is the implementation of a method for the sequential storage of hides that makes it possible to store them occupying the least possible space, without affecting the properties of the hides themselves.

[0019] Another aim of the invention is to implement a method that permits to store hides of any length and ensure effective management of space in comparison with the known methods.

[0020] Another goal is the implementation of a machine that applies the method object of the invention and permits the automatic storage and collection of hides.

[0021] A further aim is the implementation of a machine that makes it possible to record the positions occupied by each single hide, with the relevant information, so that it can be successively directed towards the most suitable production processes.

[0022] Another aim is the implementation of a simple and economic machine in comparison with the known types of machines.

[0023] Furthermore, the machine must have limited overall dimensions, independently of the size of the hides to be stored.

[0024] The aims mentioned above have been achieved through the implementation of a method for the sequential storage of hides coming from by a conveying surface that defines a longitudinal advancement direction and where the hides are positioned one after the other, which according to the main claim is characterized in that it comprises the following operations:

- driving and deposit of said hides from said convey-

- winding of said at least one flexible foil with said hides on a rotary support to form a spool.

[0025] The machine that is also object of the invention and is suitable for implementing the method described above comprises a frame resting on the ground, on which there is a driving unit for the flexible foil positioned after the conveying surface, and is characterized in that said driving unit comprises a winding unit and an unwinding unit of said at least one flexible foil, each one of said units being suitable for defining a rotation axis for a cylindrical support borne by the unit itself and placed in a substantially perpendicular position with respect to the advancement direction of said flexible foil.

[0026] To advantage, the method described makes it possible to store the hides so that they can be automatically collected with no need for the intervention of an operator.

[0027] A further advantage is represented by the fact that the machine constructed in this way is reversible and therefore can be used either for storing hides and for collecting hides that were previously stored.

[0028] Furthermore, the machine constructed in this way is very simple and compact if compared with the known machines.

[0029] The aims and advantages described above will be highlighted in greater detail in the description of one among many possible applications of the invention in question, illustrated in the attached drawings, wherein:

- Fig. 1 shows the machine object of the invention that implements the method object of the invention;
- Fig. 2 is a side view of the hides stored according to the method object of the invention;
- Fig. 3 shows a variant of the machine object of the invention suitable for implementing the method object of the invention;
- Fig. 4 shows a further variant of the machine object of the invention suitable for implementing the method object of the invention.

[0030] According to the method object of the invention, the hides are substantially wound around a cylindrical support to form a spool in which the hides are separated by a flexible foil that constitutes the core of the spool.

[0031] More precisely, according to the method object of the invention, the hides transported by a conveying surface are stored sequentially, said conveying surface defining a longitudinal advancement direction and being designed so that the hides are positioned on it one after the other.

[0032] According to the invention, the storage operation substantially comprises the following stages:

- driving and deposit of said hides from said conveying surface onto at least one flexible foil;

- winding of said at least one flexible foil with said hides on a rotary support to form a spool.

[0033] In particular, according to the method the winding of the flexible foil must take place at the same time as the deposit of the hides on the flexible foil itself.

[0034] According to a favourite application of the invention, the winding/unwinding machine object of the invention shown in Fig. 1, where it is indicated as a whole by 1, is suitable for winding/unwinding hides around/ from a spool according to the method described and substantially comprises a frame 2 resting on the ground T provided with a driving unit, indicated as a whole by 3, for the flexible foil 4 that is wound together with the hides P positioned on it in such a way as to form the spool 5.

[0035] The driving unit 3 is positioned after the conveying surface S on which the hides P are laid one after the other and comprises a winding unit for the flexible foil 4, indicated as a whole by 6, and a similar unwinding unit for the same flexible foil 4, indicated as a whole by 7.

[0036] The winding unit 6 defines the rotation axis 8 for a cylindrical support 10 of the spool that will be formed, said rotation axis 8 being arranged in substantially orthogonal position with respect to the advancement direction of the flexible foil 4. Similarly, the unwinding unit 7 defines the rotation axis 9 of a cylindrical support 11 around which the flexible foil 4 is wound, said rotation axis 9 being substantially orthogonal to the advancement direction of the flexible foil 4.

[0037] In particular, the winding unit 6 and the unwinding unit 7 are provided with reversible powering means suitable for setting them rotating on their own axis and are spaced from each other, so that the flexible foil 4 defines a substantially rectilinear section 12, preferably but not necessarily inclined, in correspondence of which the hides P transported by the conveying surface S are deposited.

[0038] The machine described above can be used as either winding or unwinding machine by simply reversing the rotation directions of the winding unit 6 and unwinding unit 7.

[0039] Operatively, when the machine 1 is used as winding machine, for the formation of the spool 5 the hides P positioned on the conveying surface S advance along the direction 20 until reaching the flexible foil 4 that at the same time is unwound from its cylindrical support 11, the latter being set rotating by the winding unit 6.

[0040] The hides P and the flexible foil 4 joined together are wound around the cylindrical support 10, thus forming the spool 5 represented in detail in Fig. 2. Operatively, when the machine is used as unwinding machine, the spool 5 formed by the wound hides is also positioned on the winding unit 6, while the direction 20 of the motion of the winding unit 6 and of the conveying surface S will be inverted.

[0041] In this way it is possible to unwind the spool 5 and collect the hides P that are laid on the flexible foil 4

by positioning them on the conveying surface S. The winding and unwinding machine described above can be constructed according to the variant described in Figure 3, where it is indicated as a whole by 100.

[0042] This machine differs from the previous one because it has a conveying surface 21 belonging to the machine structure and connected to the frame 22 through connection means suitable for permitting the variation of its inclination with respect to the direction of advancement 30 of the hides P.

[0043] Operatively, the hides P transported by the conveying surface S' reach the conveying surface 21, from which they will be deposited onto the flexible foil 4 already wound around the spool 51.

[0044] As the size of the spool 51 increases, the conveying surface 21 changes its inclination 60, in such a way as to guarantee a more suitable and correct arrangement of the hides P on the flexible foil 4.

[0045] According to a further variant of the winding/unwinding machine object of the invention, represented in detail in Figure 4, where it is indicated as a whole by 101, the winding unit 61 is removable, in fact it is provided with sliding wheels 62 that allow it to be moved away from the frame 22 of the machine itself.

[0046] It is important to observe that in each one of the two winding/unwinding machines described the tension of the flexible foil 4 is controlled by acting on powering means connected to each winding/unwinding unit and that the flexible foil 4 can, in a further variant, be stacked and not wound around a spool.

[0047] The flexible foil 4 can be preferably, but not necessarily be constituted by transpiring materials, such as paper, fabric, holed plastic, or other similar materials.

[0048] Even though the invention has been described with reference to the enclosed drawings, upon implementation changes and application variants may be made that are all included in the inventive concepts expressed in the following claims.

Claims

1. Method for the sequential storage of hides coming from a conveying surface which defines a longitudinal direction of advancement and on which said hides are positioned one after the other, **characterized in that** it comprises the following operations:

- driving and deposit of said hides from said conveying surface onto at least one flexible foil;
- winding of said at least one flexible foil with said hides on a rotary support to form a spool.

2. Method according to claim 1), **characterized in that** said winding operation of said flexible foil takes place at the same time as the deposit of said hides on said flexible foil.

3. Winding/unwinding machine (1, 100, 101), suitable for winding/unwinding the hides (P) sequentially stored on a spool (5, 51) according to the method of claim 1), comprising a frame (2, 22) resting on the ground (T) on which there is a driving unit (3) for said flexible foil (4) positioned after said conveying surface (S, S'), **characterized in that** said driving unit (3) comprises a winding unit (6, 61) and an unwinding unit (7) of said at least one flexible foil (4), each one of said units being suitable for defining a rotation axis (8, 9) for a cylindrical support (10, 11) supported by the unit itself and placed in a substantially perpendicular position with respect to the direction of advancement of said flexible foil (4).

4. Winding/unwinding machine (1, 100, 101) according to claim 3), **characterized in that** said winding/unwinding units (6, 61, 7) are spaced from each other and define at least one substantially rectilinear section (12) of said flexible foil (4) on which said hides (P) are deposited or from which they are collected.

5. Winding/unwinding machine (1, 100, 101) according to claim 3), **characterized in that** said at least one flexible foil (4) is constituted by a single continuous band.

6. Winding/unwinding machine (100, 101) according to claim 3), **characterized in that** said conveying surface (21) belongs to the frame (22) of the machine (100, 101).

7. Winding/unwinding machine (100, 101) according to claim 6), **characterized in that** said conveying surface (21) is connected to the frame (22) through connection means suitable for permitting the variation of its inclination (60) with respect to the direction of advancement (30) of said hides (P).

8. Winding/unwinding machine (100) according to claim 4), **characterized in that** said rectilinear section (12) is inclined.

9. Winding/unwinding machine according to claim 4), **characterized in that** said rectilinear section is horizontal.

10. Winding/unwinding machine (1, 100, 101) according to claim 3) or 4), **characterized in that** at least one of said winding (6, 61) or unwinding (7) units is provided with powering means suitable for setting it rotating around its own axis (8, 9).

11. Winding/unwinding machine (1, 100, 101) according to claim 10), **characterized in that** said powering means are reversible.

12. Winding/unwinding machine (101) according to claim 3), **characterized in that** said winding unit (61) can be removed with respect to said frame (22), being provided with sliding wheels (62) suitable for permitting its separation from the frame (22) itself. 5

13. Winding/unwinding machine (1, 100, 101) according to claim 5), **characterized in that** said continuous band is made of paper. 10

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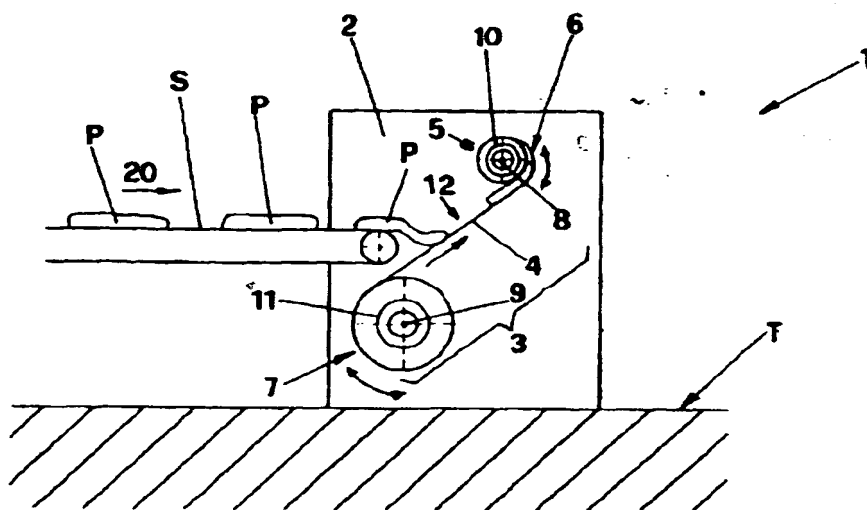


FIG.1

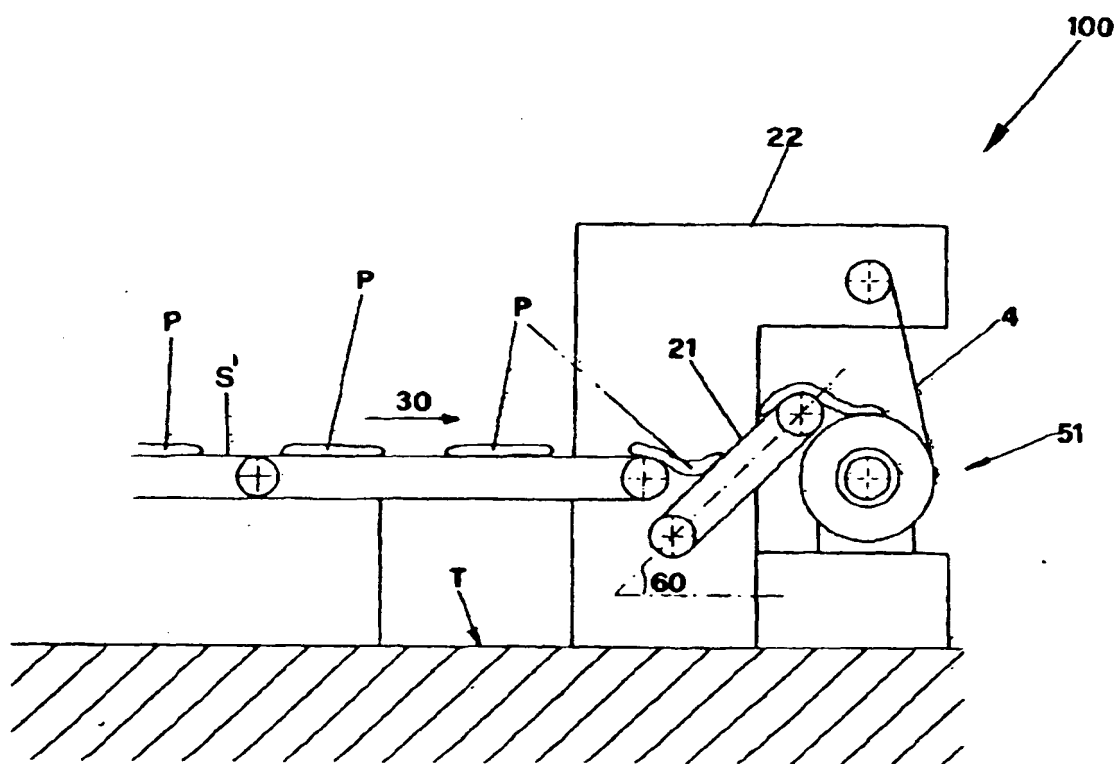


FIG.3

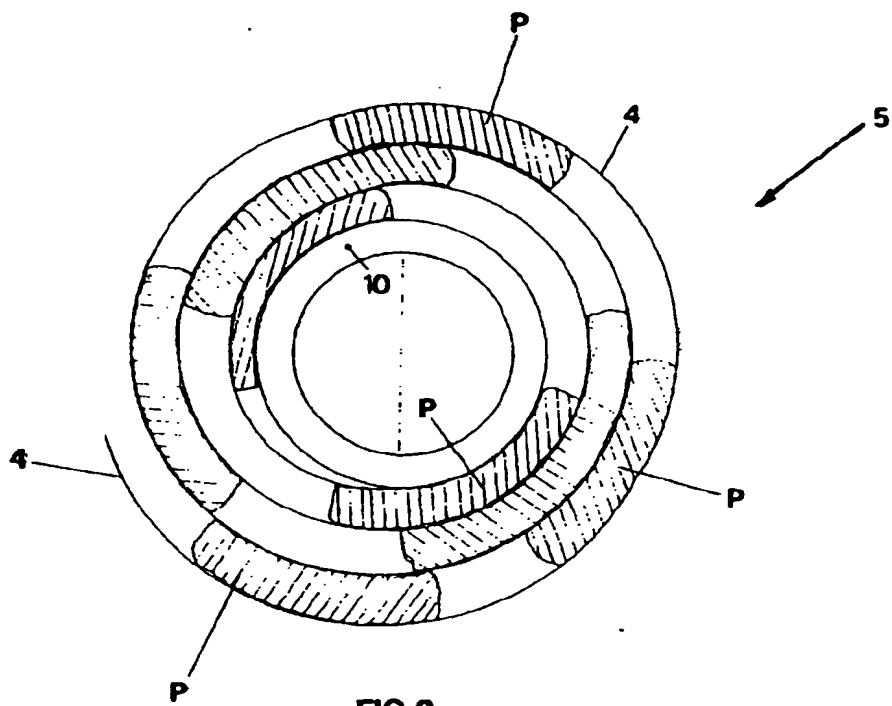


FIG. 2

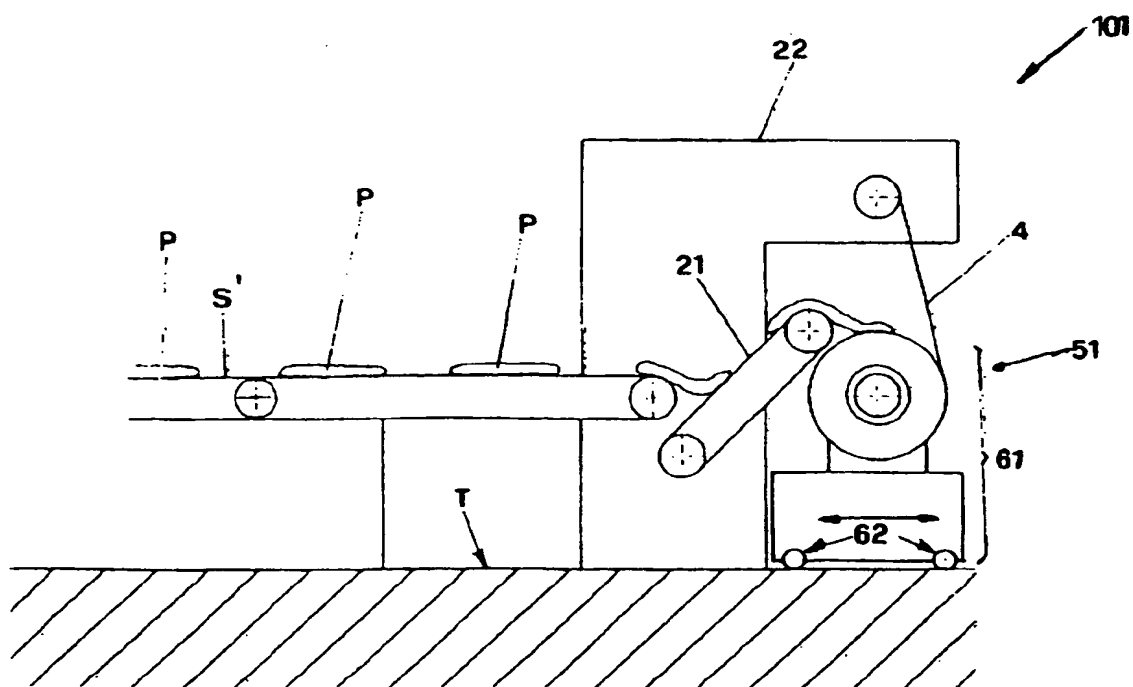
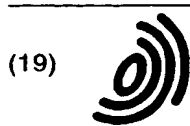


FIG. 4

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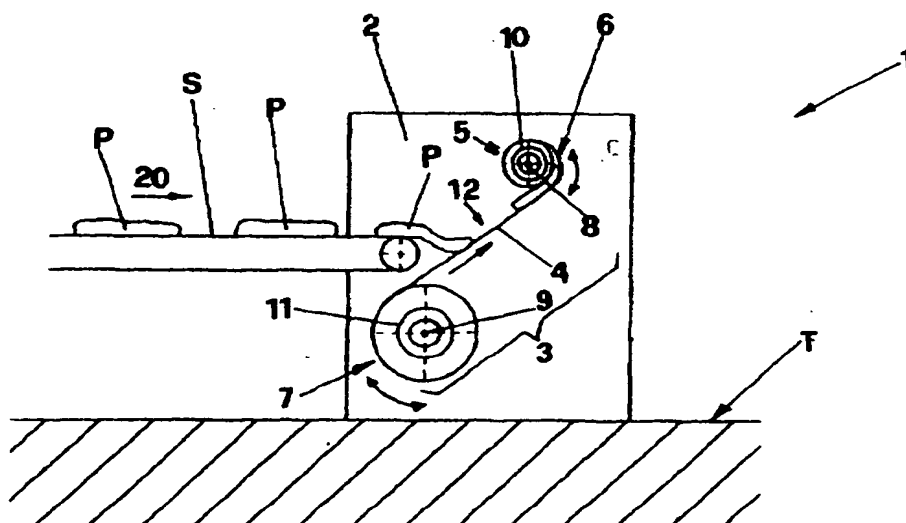


FIG.1



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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 0577

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|--|--|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (InCL7) |
| X | US 3 813 843 A (WOOLDRIDGE J ET AL) 4 June 1974 (1974-06-04) | 1-6, 8, 10, 13 | B65B63/04 |
| Y | * column 4, line 30 - column 5, line 35; figures * | 9 | |
| Y | BE 674 589 A (EASCO LEASING CORP.) 15 April 1966 (1966-04-15) * page 11, line 1 - page 12, line 19; figures * | 9 | |
| The present search report has been drawn up for all claims | | | TECHNICAL FIELDS SEARCHED (InCL7) |
| | | | B65B |
| Place of search | | Date of completion of the search | Examiner |
| THE HAGUE | | 19 November 2001 | Jagusiak, A |
| CATEGORY OF CITED DOCUMENTS | | | |
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| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|---|---------------------|----------------------------|---------------------|
| US 3813843 | A | 04-06-1974 | NONE | |
| BE 674589 | A | 15-04-1966 | NONE | |

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